gests that the color layers act as a screen for the conversion of light into heat, useful not only in the trans-location of the carbohydrates, but also in all metabolic processes. Such a use is subserved in alpine plants; in those of eastern North America, in which the climatic conditions are alpine; in the pistils of anemophilous plants, to promote the growth of pollen tubes; in extra floral nectaries, to accelerate the metabolism of the carbohydrates, and in many adaptations in the Cryptogams.

Reasoning from the fact that a large number of plants growing in shady moist situations, and in the tropics where the air is much warmer than the leaves, are provided with erythrophyll, absent from specimens under the opposite conditions, he substantiates and extends the idea of Kerner that the color in these instances is a device for promoting transpiration.

Further, the colors of young shoots and leaves act in the same manner, and, by increasing the amount of water conducted to these parts, secure a greater supply of nutritive salts.

It is but proper to say, however, that this method of reasoning does not explain in any adequate manner the autumnal colors, nor of course the occurrence of colors in external hairs, or in the internal tissues, where no relation, or no useful relation, to light can exist.

By far the most interesting portion of the paper is that in which the results of the investigation upon the whitish or silvery patches due to air cavities underneath the epidermis of leaves of Begonia, Dracæna, etc. It was found that if the under side of such leaves were coated with some substance easily melted, such as cocoa butter, and the upper side exposed to light or heat, the portions of the leaf under the silvery areas were less easily heated, and consequently less easily cooled, than the neighboring green areas.

This device retards chlorophyll action, but under the cool, damp conditions in which such plants are found it promotes transpiration by preserving a temperature higher than the surrounding atmosphere.

The velvety appearance of many leaves is found to be due to the papillose extension of the epidermal cells in such form as to act as lenses in entrapping rays of light or heat striking the surface at any angle, thus securing an additional aid to transpiration.

The chief results of the paper may be summarized as follows: The existence of 'warning' colors is not proven; the conclusion of Pick that leaf-red converts light into heat, useful in translocation of carbohydrates, is broadened to include the general metabolism of the plant in its application; the 'protection' theory of leaf-red by Kerner is refuted in great part; the conclusions of Kerner as to the uses of leaf-red as a means of promotion of transpiration are extended and substantiated; and the silvery white as well as the 'velvety' appearance of many leaves are to be regarded as means for the promotion of transpiration under different circumstances.

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CURRENT NOTES ON ANTHROPOLOGY.

MORTUARY CEREMONIES.

PROPERLY studied, the mortuary ceremonies of tribes offer one of the most productive fields of ethnologic research. A valuable contribution to this branch has lately appeared in Dr. W. Caland's *Die Altindischen Todten- und Bestattungsgebräuche* (pp. 191, J. Müller, Amsterdam, 1896). Its investigations are based on a close collation of the rituals for the dead in the various Vedas and other sources, a number of them still in manuscript. The earlier researches of Colebrooke, Wilson, Max Müller and others have been considered, and extensive additions to their studies are

offered. All the steps of the ceremony of incineration are examined in the original texts, followed by those referring to the gathering of the bones, the erection of the funerary monument, the offerings to fire, the strewing of the seed, and the numerous steps of the complicated ritual. These the author handles with a thorough mastery of the subject and the language. When it is remembered that to an ancient Aryan (and to many non-Aryans) no object in his life was so important as that he should have proper funeral rites, the interest attached to such ceremonies will be appreciated.

M. Felix Regnault, in the Bulletins de la Société d' Anthropologie of Paris (Fasc. 1, 1896), in an article on funeral rites, argues that incineration and various other methods of destroying the flesh were intended for the benefit of the living, not to follow out the wishes of the dead. The survivors wanted the bones for charms and fetishes.

THE PSYCHOLOGY OF PRIMITIVE MAN.

WHAT is the mental state of savages, and, going beyond them, what were the mental powers of early man, are queries of prime interest in ethnology. Some have placed the hunting tribes on a par with immature individuals in civilized lands; while others hold 'the gray barbarian lower than the Christian child.' This is the opinion of Dr. Friedmann, who, in a paper analyzed in the *Centralblatt für Anthropologie*, Heft 3, undertakes to prove that the state of primitive thought is nothing more nor less than insanity, and has its parallel only in our asylums for mental diseases. He claims that to the savage, as to the insane, there is no distinction between the idea and its reality, that the law of causality is restricted to the narrowest sensuous limits, and that the logical processes of thought are constantly violated. All this is true, but do we dare or care to say how true it is also of the people at large around us?

The same subject has been treated at length by Prof. Pinsero, of Palermo, whose views are epitomized in *L'Anthropologie*. He thinks that early man was mentally lower than the anthropoid apes, for these had a religion, to wit, serpent worship (!) and man had none.

No doubt the estimate of the savage mind has been placed too high by various writers; but this looks as if the current is just now as much too strong in the other direction.

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SCIENTIFIC NOTES AND NEWS.

SCIENTIFIC RESEARCH AND COMMERCIAL SUCCESS.

A LETTER from Prof. W. Ostwald on scientific education in Germany and England has been communicated by Prof. W. Ramsay to the London *Times* and is made the occasion of 'leaders' in that journal and in *Nature*. Germany has, as is well known, supplanted Great Britain in the control of the fine chemical markets of the world, and this is due more to scientific research than to commercial enterprise. Prof. Ostwald informs us that there are many chemical works in Germany, each of which employ more than one hundred students of chemistry who have taken their Doctor's degrees at the University, and are engaged not in the management of the manufacture, but in making inventions. These chemists have been trained for years under men such as Prof. Ostwald; they have published theses containing the results of original research, and finally are able to devote their lives to invention and investigation. Those who cannot appreciate the scientific importance of research will be convinced by the logic of commercial success.

If a very small part of the money spent by the government of the United States in the protectection of manufactures by import duties had been used in higher technical education, and especially in the encouragement of scientific research, we feel sure that the industries and commerce of the country would be in a very different condition from that in which they are